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ABSTRACT

This reappraisal of the situation of instructional television (ITV) in education begins by defining the field, providing background information, describing the various roles that ITV can fill, and discussing the structure of ITV as a profession. Various aspects of ITV use are then discussed in the context of: (1) national use statistics on ITV accessibility, ITV use, barriers to use, and training teachers in its use; (2) data on budget support, personnel, administrative encouragement of ITV use, and changes in ITV accessibility; and (3) qualitative data on equipment, programming, and support systems for ITV. An examination of research and evaluation which considers three types of inquiry--basic research, formative evaluation, and impact studies--is followed by a discussion of ITV issues and futures in the areas of research and development, design, production, distribution, promotion, use, and measurement and evaluation. The report concludes with a discussion of factors critical to the present and future of ITV. Eight figures and three tables are included. (54 references) (MES)

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A REAPPRAISAL OF INSTRUCTIONAL TELEVISION

Marjorie A. Cambre

ERIC

An Information Analysis Product
1987

ERIC Clearinghouse on Information Resources
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INTRODUCTION

In a paper presented at the 1987 Association for Educational Communications and Technology conference, William Winn wrote:

> We [scholars and practitioners in the educational technology field] touted instructional television for a number of years. It worked, up to a point. But when it failed to live up to its expectations, we could only explain why in terms that avoided the real issues—teachers refused to use it; it cost too much; people did not put enough money into producing quality programs. These read like excuses rather than explanations. If we had really understood that it was not television per se that was involved in any apparent improvements, but other "confounding" factors, we would have directed our attention not at the medium of television but at the instructional methods that users of television might employ with students, the settings in which instruction takes place, the cognitive processes it engages through its use of symbols, and so on. (Winn, 1987, p. 46)

While Winn might have used any one of a number of media to make his point, he chose instructional television (ITV). Instructional television has become the symbol in the minds of many researchers of the "failed medium," the unproductive experiment, the case study that should not be replicated. Researchers and educators are warned not to make the same mistakes with computers that they made with television (Salomon & Gardner, 1986). In an excellent book about children and television, Aimee Dorr, noted social science researcher and developmental psychologist, states, "There is little concern about children viewing television in school, because few children ever watch there" (Dorr, 1986, p. 103).

The purpose of this monograph is to "reappraise" the situation of instructional television in education. Are its critics justified in dismissing it as a failed medium? What were the promises/expectations it didn't live up to, who made them, and why? Is it being used today, and if so, to what effect? What do practitioners see as the important issues surrounding it? Is Winn right in implying that, had researchers asked different questions, another scenario would have emerged? Does instructional television have a future?

These questions will guide the discussion in the pages that follow. First, it is important to clarify what is meant by instructional television, to describe the structure in which it exists today, and to briefly trace its path to the present.

DEFINING THE FIELD

Definitions

The ubiquity of commercial and educational (public) television leads most people to assume that they know what ITV is. This is not in every instance an accurate assumption. Instructional television has traditionally been defined as television designed and produced specifically for elementary and secondary grade students with the expectation that it would help those students to achieve "identified, specific learning goals under the administration and supervision of professional educators in a formally structured learning environment" (Sikes, 1980, p. 19). Examples of instructional television in current use include "ThinkAbout," "The Inside Story of Slim Goodbody," "Newscasts from the Past," and "All about You." These and other ITV programs of the same ilk are usually broadcast on Public Broadcasting System (PBS) stations during the school day. Because of the relative inaccessibility of ITV programming to those working outside school or home settings, many critics of ITV, including researchers, have had very limited exposure to it unless their VCRs are liberally exercised.

The more familiar type of programming is "educational television," now called "public television," which has the broader mission of conveying information and culture to audiences of all ages. Many of these programs are now used in schools or assigned for home viewing, and are broadcast on PBS stations from approximately 4 pm through prime time. Examples of these programs include "Nova," "Shakespeare," and the "National Geographic Specials." Also in this category are the Children's Television Workshop's series, most notably today "Sesame Street," "3-2-1 Contact!," and the new mathematics series, "Square One." Several of these series are available in ITV schedules as well as after-school PBS lineups.

Yet another use of television in schools is as an object of study, with a specified curriculum sometimes called "critical viewing skills." Commercial television programs usually provide the content, which is studied for production and persuasion techniques.

Television, or more appropriately video, is also used in schools as a communication device. Classroom and school productions allow students to gain hands-on experience on both sides of the camera.

In addition, there is extensive use of television in "telecourses," which are usually meant for the off-campus, postsecondary student, and which often offer college credit.

"Distance learning" generally has a television component, and usually refers to the transmission of a televised class from one point to another, sometimes with two-way interaction.

Any two or more of these uses of television/video in formal education settings may overlap, and at one time or another all have been included under the rubric "instructional television." This confusion of terms makes it very difficult to interpret what a writer means when the term "television" is used in connection with schooling, or when a researcher declares that ITV is "dead."

The confusion is exacerbated by the multitude of delivery systems available for the dissemination of the television picture. The most common transmission of the ITV signal is by satellite to PBS stations, or to local cable companies or ITFS (Instructional Television Fixed Services) systems. Some school systems and regional media centers have invested in satellite dishes to receive the ITV signal directly through Direct Broadcast Satellite (DBS). Few expect that signal to be used live in the classroom; on the contrary, videotape has become the medium of choice for using ITV programming. Tapes may be recorded from the satellite signal or from intermediate distribution signals, or they may be purchased directly from distributors.

There is a recent movement afoot from within the ITV community away from the use of the word "television." The ITV Futures Planning Group (see the chapter on "Issues and Futures") chooses to describe its domain as "Learning Technologies." The Agency for Instructional Television (AIT), the oldest and largest producer/distributor of ITV materials, recently changed its name to the Agency for Instructional Technologies. In its recent publications, AIT prefers to speak of "video technology" when describing instructional television. The new names represent a shift in emphasis precipitated primarily by the infusion of the videotape recorder, the computer, and (by anticipation) the videodisc, into the schools. A serendipitous side effect is the shedding of negative associations with commercial television and with the image of ITV as a failed medium.

In keeping with the retrospective aspects of this monograph, the reader is advised that unless otherwise noted, the traditional appellation "instructional television" (ITV) will be used to refer to the type of programming described in the Sikes definition above, including the programming from the "educational television" domain that is frequently used by teachers in schools. For typical examples, the reader is referred to the list of the 25 most frequently used programs provided in the 1982-83 *School Utilization Study Final Report* (Riccobono, 1985).

Heritage

In order to understand what instructional television is today and where it seems to be going, it will be informative to review highlights of its historical foundations and influences. The history of instructional television is closely intertwined with that of public television, and that in turn with the history of commercial broadcast television in this country. Wood and Wylie (1977) trace the first broadcast educational television programs to The State University of Iowa at Iowa City in 1933.

Between 1932 and 1939, this experimental educational television (ETV) facility created 389 educational programs.

In the 1940s, educators teamed with local commercial stations to produce and disseminate instructional programming. These efforts ranged from training air raid wardens in New York City and elementary and secondary school classroom instruction in Philadelphia, to university-produced public awareness programs in at least eight cities throughout the country (Wood and Wylie, 1977, p. 29).

The first noncommercial ETV station to go on the air was KUHT-TV, Houston, which began broadcasting in 1953. By the end of 1958, there were 35 ETV stations on the air, and the country was well on its way to providing ETV to every market, a goal which has been virtually accomplished today with a current total of well over 230 public television licensees.

The impetus to "push" television in the schools began in earnest in the early 1950s when the Federal Communications Commission (FCC) needed convincing that television channels should be allocated for education. The Joint Committee (later Council) on Educational Television (JCET) was formed to spearhead the effort to keep the young educational television movement alive and growing. Its members solicited hundreds of letters from educators to support the notion of using television for educational purposes. As negotiations in Washington became more intense, many of these testimonials became public in one form or another, and the image was born that this new technology would someday transform education as well as enlighten the American public.

It was in this climate that Wilbur Schramm wrote in 1959:

> Just this side of the horizon but coming fast are certain new teaching devices which are likely to make a profound change in what happens in the American classroom.
>
> Chief among these new devices are instructional television and tutorial machines. In their potential importance to our schools, they have been compared to the textbook. And they have much more impact than the textbook, for whereas the text developed slowly over several hundred years, these new devices are coming into being and into use in only a few years, and at a time of great need. (*New Teaching Aids*, 1960, p. vii)

The U.S. Office of Education spurred the growth of ITV in the late 1960s by funding ITV libraries to serve as clearinghouses for the best locally-produced programs. The National Instructional Television Library (NITL), which was created in New York in 1962, would go through several transformations, including moving to Bloomington, Indiana, under the auspices of Indiana University, and in 1973 it became independent as the Agency for Instructional Television (AIT). AIT is largely responsible for upgrading the quality of ITV through the consortium concept for design and production. To date AIT has produced 25 consortium series, fitting tributes to the 25 years of its existence.

Two regional libraries were funded in the early 1960s, one in Lincoln, Nebraska, and one in Boston. The Great Plains National Instructional Television Library in Nebraska still functions as one of the largest distributors and producers of instructional television; the Boston operation which subsequently evolved into the Eastern Educational Television Network (EEN), ironically no longer maintains an ITV component although it is still very active in the educational (public) television arena. Of the three regional networks that serve ITV today, the Southern Educational Communications Association (SECA) and the Central Educational Network (CEN) were founded in the late 1960s, and the Pacific Mountain Network (PMN) was created in 1977.

The Public Broadcasting Act of 1967 legislated the creation of the Corporation for Public Broadcasting (CPB), a nonprofit, private corporation. CPB was set up to administer federal funds to assist in the development and growth of new stations, to establish an interconnecting public television system, to obtain grants, to provide funds for the support of program production, to make grants to stations for the enhancement of local services, and to conduct research and training projects.

In response to its mandate, one of the first and most significant acts of the newly formed board of CPB was the creation of the Public Broadcasting Service (PBS) as the networking agency to connect public television stations. PBS's functions were to select, schedule, and distribute network programming; it was not to be a production center. PBS began functioning in 1970.

It is fair to say that through the years the lion's share of attention and resources of both these agencies has gone to educational (public) television. Although ITV staffs are maintained in both and play an active role in the field, funds are much more readily funneled to prime time programming than to school television.

Much more detailed accounts of the history of instructional television are available in Wood and Wylie (1977), Middleton (1979), Saettler (1968), and Sikes (1980), among others.

Images

Through the years ITV has assumed many different images in response to the exigencies of the times. These also form part of its heritage and help explain why some things are the way they are today.

Television as Master Teacher. In the late 1950s and early 1960s, with television production technology largely confined to studios and live broadcasts, instructional television was promoted as a vehicle for disseminating exemplary teaching. The master teacher idea spawned studio classrooms in which "talented" teachers conducted classes that were broadcast widely. The use of television was said to fill two needs: (1) overcoming the shortage of qualified teachers (particularly in science, math, and languages), and (2) eliminating classroom overcrowding. Some television enthusiasts went so far as to suggest a restructuring of schooling. The Educational Media Study Panel, a group of educators and broadcasters assembled in 1960 to advise the Commissioner and the U.S. Office of Education, published the following in 1961:

> Experience indicates that the most effective uses of television have been in situations where it has been combined carefully with other activities in a total learning situation; and where students were strongly motivated to learn from it. This challenges educators to make a broad review and restructuring of what happens in the classroom. Television can share the best teaching and the best demonstrations; self-instructional materials can conduct drill expertly and give the student a new freedom to work at

his own best rate. A teacher who has these devices working for him may not have exactly the same duties as before, but his duties will be no less important. The student who has these devices working for him will not spend his day exactly as before, but his learning opportunities will be no less, and probably considerably more.

A school where these new devices are in use may find itself bursting out of old patterns. Instead of classes of 35 alternately being lectured to, studying, and reciting, it may assemble groups of several hundred to watch the television lecture or demonstration, but devote a greater proportion of its teacher time to individualized instruction. Instead of waiting his turn for class drill, a student may follow his own drill schedule with self instructional materials or language laboratory. (*Educational Television*, 1962, p. 5)

Adding insult to injury, proponents of the master teacher idea suggested that while being replaced by the television teacher, the classroom teacher could use the opportunity to watch the master teacher for purposes of improving her teaching skills! In 1965 Costello and Gordon wrote:

> After about 15 years of research into educational television by teachers and administrators, one conclusion is clear. Television is a *means* by which good teaching can be spread to more people than ever before in the history of the world, probably at less cost per student than present instruction. (p. 13)

In retrospect it is clear that talented teachers were not necessarily the best television talent. It is also evident that production values are important for holding audience interest. The master television teacher concept did more to threaten classroom teachers and bore students than it did to promote the use of instructional television or to solve the problems of education. In fact, the situation was so bad in instructional television in the late 1960s that this statement appeared in the report of the Carnegie Commission on Educational Television: "With minor exceptions, the total disappearance of instructional television would leave the educational system fundamentally unchanged" (*Public Television*, 1967, p. 81).

As practitioners began to realize that the "talking head" format resulting from the master teacher concept was not the best use of the medium (and even perhaps that a talking head was not the best method of teaching), arguments for using television were put forth that were diametrically opposed to those of earlier years. The basis of the new arguments was that television should be used to do what teachers could *not* do in their classrooms.

"You Are There." In its next phase, instructional television was promoted for its ability to bring not master teachers, but *the world* to the classrooms of America. In Wilbur Schramm's popular book, *Quality in Instructional Television* (1977), the point is made that instructional television is often at its best when it does not instruct, that the job of television is to

take children out of the classroom, and to convey the *human* aspects of situations rather than factual information (pp. 13-14).

Aided by the availability of videotape and portable equipment (film, of course, was always available), production crews could indeed get out of the world of the studio and into the world of real people and living things. The "look" of ITV changed dramatically for the better; its uses did also, but with more mixed results.

At about the same time, a similar yet slightly different argument was being made for using live commercial television in the classroom; i.e., that allowing children to witness special live news events would give them a sense of belonging to the world, a sense of sharing in the making of history.

These arguments were more palatable to teachers, who would much rather be usurped by a news event or an educational "tour" than by another teacher, and to administrators, who could buy one or two television sets for the auditorium rather than one for each classroom. Unfortunately, the "you are there" phenomenon had the negative effect of relegating television to the position of enrichment, from which it has never really recovered. First, it conveyed the notion that television was interruptive in that however infrequently important news events were broadcast during the day, everything else stopped when they were aired so that students and teachers might watch television. Second, it suggested that television was an occasional special activity much like assemblies, field trips, and sporting events; that it was used in larger gatherings, rather than in the regular classroom; and that it was not *really* related to school work.

A third and more subtle effect of this kind of school television promotion was the perpetration of the notion that television is a unidimensional reality. Because, to this day, we use the word with an occasional qualifier to mean everything from " 60 Minutes" to "Dallas," from "Nova" to "ThinkAbout," we invite predispositions depending on a person's background and customary use of the medium.

Curriculum Extension. Throughout much of the 1970s ITV proponents had to fight the prejudices they inherited from earlier times; i.e., that television was a boring replacement of teachers on the one hand, or that it was merely incidental on the other. They did so mainly by creating high quality, curriculum-related school television series that utilized the conventions and formats of the medium in an entertaining, "softly" instructional way. The prevailing argument at this time was that television should be used in schools to *broaden* the curriculum by introducing new subject matter that was not currently being taught, such as economics, art, critical thinking, and problem solving. In contrast to the "deadly dull" productions of earlier decades, school television of the 70s took on a much more polished and entertaining look to present curriculum-related subject matter that teachers might not ordinarily deal with in a way that could not be replicated in the classroom. School television was now promoted not as a replacement, but as an extension of the teacher; not as enrichment, but as an important complement to the classroom curriculum.

Basic Curriculum. By the late 1970s the pendulum had swung from the new and non-standard curriculum areas back to the basics in response to yet another of the "Back to Basics" movements that occur with regularity in public education. The Skills Essential to Learning projects from AIT were products of this movement, as were "The Write Channel" from Mississippi ETV, "Counterplot" from Maryland ITV, and a host of others. The result was a respectable body of ITV materials designed to assist teachers in teaching not only the basic skills but their application to life situations.

Looking to the future, the "Designs for Education" report to the Corporation for Public Broadcasting suggests that instruction in the humanities, world affairs, understanding of human and institutional interactions, and problem solving would assume center stage in ITV production (*Designs for Education*, 1983). The new series seem to bear this out. "Newscasts from the Past" is an award-winning history series produced in 1986, and AIT is currently finishing a major series in world geography and cultures.

Although there are never enough good ITV series to satisfy all needs, a surprisingly large number are available today. Bill Meyers, the director of the Southern Educational Communications Association (SECA) Center for Instructional Services for SECA, reports that there are 606 titles in the SECA "group buy," with well over 500 of those being entire series. AIT alone lists 145 series in its 1987 catalog.

While content might be from the same domains, the image of ITV in the 1970s and 1980s has changed dramatically from the early days of studio productions. The tendency now is to illustrate through dramatic formats or vivid documentaries how skills learned in school apply to everyday life. Theory born of experience is that children like and attend to television programs with story lines, and that boys prefer action-packed themes while girls prefer the heart-warming programs. Content is embedded, more or less obtrusively according to production style, into dramatic vignettes with occasional lapses into direct instruction through animation, graphics, or more rarely, an on-screen teacher/actor.

The ties to television, both commercial and public, are most evident in the structure and formats of contemporary ITV. Series are produced, programs are timed to fit into broadcast schedules, and, typically, professional actors are hired to perform dramas written by professional script writers. The finished product is expected to be slick, entertaining yet instructional, relatively fast paced, and, above all, eliciting broad appeal.

Many individuals and organizations had a hand in rescuing ITV from near disaster in the early 1960s, but none did so more dramatically than AIT and its predecessor organizations. Middleton (1979) traces the history of the agency and of the consortium process it inaugurated. Of that process he writes:

> A number of ideas are incorporated in the consortium approach to the development of school television programming. Some of these have to do with the capabilities of television as a medium and its ability to

facilitate change. Others are concerned more specifically with the learning materials produced and how they are designed to strengthen instruction. A third set of concepts relate to the lifeblood of the consortium process—cooperation. (p. 16)

By banding together educators at the state and provincial education agencies for financing and curriculum development, AIT transformed the image of ITV from one of amateurish local production to one known for the professionally designed and produced instructional materials available today.

Structure

In the 30 or more years of its existence, instructional television has assumed continuously evolving forms and structures as a profession within the general field of educational communications and technology. If there is any common theme to the structures as they have evolved, it is that of creative tension between centralization and decentralization. Although the national and regional organizations mentioned above support ITV in various ways, state and local education agencies control its use in a given location and vigorously resist efforts to centralize ITV governance.

At the present time there are over 150 ITV agencies in the United States. Headed up by an ITV director, these agencies are often divisions of state departments of education or of public broadcasting stations. Some are independent organizations, others function under the aegis of state boards of regents, local school boards, or other educational governing groups. These local agencies provide the ITV fare for school districts and schools in their viewing areas. Their primary contacts are district and school level ITV coordinators, or where these don't exist, media center directors, librarians, teachers, and school administrators themselves. In 1982-83, approximately 55 percent of the schools with ITV available had building-level ITV coordinators, and approximately half of the districts with ITV available had district-level ITV coordinators (Riccobono, 1985, p. 6).

The main contacts between the ITV agencies and the schools are ITV utilization specialists, of which there are approximately 380 today. These are typically ex-teachers who have been hired by the agencies because of their interest and skills in using ITV and their ability to train other teachers to do so. Through workshops, mailings, and school visits, the utilization specialists encourage the use of television in schools.

The expense and expertise involved in typical ITV programming, coupled with the complexities of distribution and the legalities of leasing rights, have necessitated support structures at several levels. Three regional agencies support ITV at the present time: PMN (Pacific Mountain Network), CEN (Central Educational Network), and SECA (Southern Educational Communications Association). These agencies coordinate and administer group buys of ITV products, arrange satellite and broadcast feeds, encourage local productions, and above all provide forums for both intra- and inter-regional professional exchange. In addition, each has a responsibility within the national ITV community.

PMN is responsible for FirstView, a yearly gathering at which all new ITV materials are screened. This meeting gives potential purchasers an opportunity to learn about new programming and producers a chance to assess the needs for the coming years. CEN conducts SatScreen, a companion piece to FirstView which allows a broader viewing audience to see new programming via satellite broadcast. Teachers and curriculum specialists are encouraged to take advantage of this national screening. Once new programming has been selected and added to the schedule, SECA administers the transmission via NISS (National Instructional Satellite Schedule), and a total of 1,244 hours of ITV programming is transmitted throughout the school year.

PBS's function regarding ITV has always been somewhat unclear, although its elementary/secondary division is represented at all ITV functions and serves as a resource for the national viewpoint. Through the years PBS has been especially interested in the marketing and promotion of ITV. That PBS is taking an active leadership role in planning for the future will be seen in a later chapter.

The Corporation for Public Broadcasting (CPB) also represents the national picture in ITV circles and plays the important role of administering federal funding.

Selected highlights from ITV's history and present structure are mentioned here to illustrate two points: (1) ITV exists today both because of and in spite of its ties to public television; and (2) ITV's history is marked by a progression from local production and control to centralization of services as broadcasting has become increasingly complex.

The production, distribution, and utilization of instructional television is a labor-intensive, expensive, and complex endeavor. Through the years it has become an industry with hundreds of professionals working to sustain it. It shall be seen in the remaining chapters whether the results seem to warrant the effort and expense.

ITV USE: FIGURES, FACTS AND FANTASIES

The traditional measures of success for educational media are degree of penetration of the marketplace and amount of use. Right or wrong, educators measure educational media no differently than other entrepreneurs in this regard, having bought into the "more is better" and "all or nothing counts" culture. By this yardstick ITV utilization data are periodically collected, analyzed, and judged to determine if the medium is a "success" in American education.

This chapter is an attempt to represent and reinterpret some of the data about ITV availability and use amassed so far during the decade of the 1980s. Because the *School Utilization Study* (Riccobono, 1985) provides a major source of data from a national sample, it will be summarized rather extensively here. It should be noted at the outset that this synopsis of the data can in no way replace the thorough reporting found in the Riccobono study, and the reader may want to refer to that document for more detailed information. The purpose here is to view the data from the perspective of reappraising ITV. The data are represented slightly differently than they are in the original document in order to isolate relevant aspects of the situation of ITV in the schools, for the most part disregarding the other media surveyed in the study.

The statistical data will be complemented by excerpts from a qualitative study of teachers who use ITV, which was commissioned by the Agency for Instructional Technology (Carlisle, 1987). While these data carry the stigma of self-interest, they are honest and real accounts of situations that exist in the nation's schools as perceived by a professional writer and journalist. A third source of information bearing upon the situation of television in the schools of the 1980s is the equipment penetration data collected by the Quality Education Data Company (Hayes, 1986). These data corroborate some of the *School Utilization Study* (*SUS*) figures and point out an interesting trend that may have significant implications for the future.

National Use Statistics

Conducted in 1982-83, the *School Utilization Study (SUS*), employed a stratified multi-stage probability sample that involved 619 school districts and Catholic dioceses with enrollments of 300 or more, 1,350 schools within selected districts, and 2,700 teachers within selected schools. Taking into account sampling error, the researchers claim that their final sample is representative of approximately 11,500 public school districts and Catholic dioceses, 81,000 school buildings, and 2,137,00 classroom teachers (Riccobono, 1985, p.2).

Data were solicited by mail from three groups of educators—superintendents, building principals, and classroom teachers—and follow-up telephone interviews were conducted with nonrespondents to the mail survey. Although data were solicited about all media used in schools, with a few noted exceptions those reported here deal only with instructional television. Instructional

television was defined in the study as "any in-school uses of television programming and equipment for instructional purposes." This broad definition of instructional television encompasses all of the terms defined in the previous chapter. It is therefore impossible to tell from these data what is really meant by ITV at any given time, although it can be assumed that mo responses refer to the traditional meaning of the term.

For purposes of this monograph data from several tables in the *School Utilization Study* have frequently been collapsed into one table. Where possible, the numbers of the original tables from which the reported data are drawn have been indicated.

Table 1: ITV Availability
(Compiled from *SUS* Tables 1, 20 & 31)

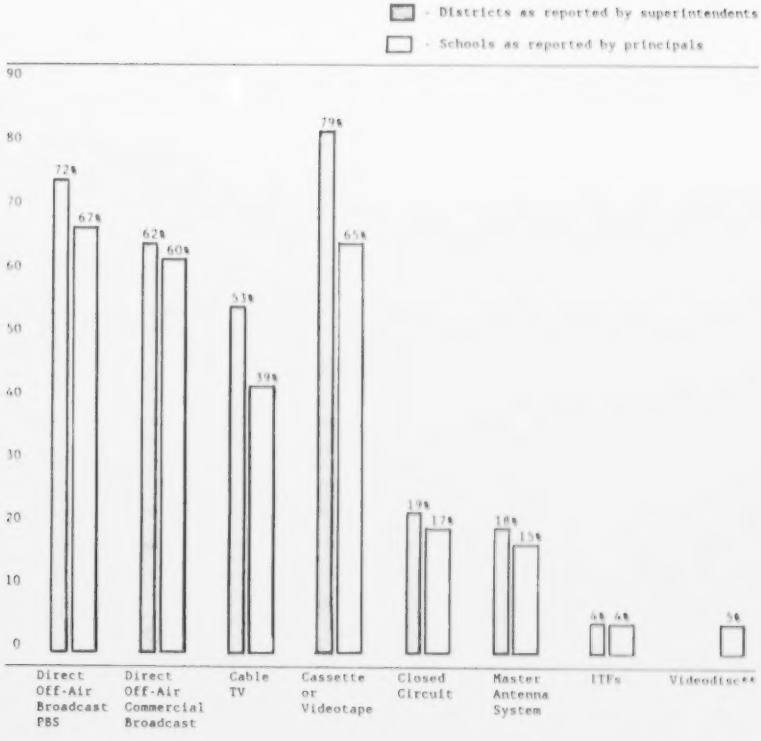
Source of Information	Unit of Measure	% with ITV Available	Estimated Number
Superintendents	School Districts	91%	10,465
Principals	Schools	94%	76,140
Teachers	Classrooms	70%	1,495,900

From the aspect of reported availability, instructional television in one form or another has "made it" into the educational systems of this country. Another encouraging statistic is the way in which ITV is now available in schools. Technology continues to provide new, more convenient means of accessing information. In the television arena this makes possible the breakdown of the manner of ITV availability presented in Figure 1.

The point of interest here is that videocassette/tape has become as popular a means of accessing ITV as broadcast television, a phenomenon undoubtedly supported if not encouraged by the proliferation of 1/2-inch video equipment in homes. The two most popular ITV access modes (broadcast and videocassette) are complementary rather than competitive, as evidenced by the fact that 11 percent of the teachers reported recording ITV material at home, 14 percent said they recorded it at school, 55 percent requested recordings be made by other school personnel, 20 percent reported having no resource to record off air, and only 15 percent said they never wanted to record off air (Riccobono, 1985, p. 19).

ITV Accessibility. Since videocassette recordings seem to be such an important factor in ITV availability, it is important to note how video recording equipment and television monitors are distributed within the schools, i.e., how accessible they are to teachers. According to school principals reporting the availability of ITV, that breakdown is as shown in Table 2.

Figure 1
Percentages of Districts and Schools
Reporting All Methods of
ITV Availability*
(SUS, 1982-83)



* Percentages based on all districts and schools with ITV availability from Tables 3 and 19

** Not asked on Superintendents questionnaire

Table 2: Video Equipment Accessibility by Grade Level (*SUS* Tables 21, 22)

	Elementary	Middle/Junior High School	Senior High School
% of schools with videotape/cassette available	56%	83%	94%
# of teachers per videotape/cassette recorder/player	15.46	20.91	23.04
# of teachers per television set	5.47	8.97	10.80

Since accessibility is the true test of availability, it is at this point that the numbers become disappointing if universal use is the expectation. All research on teacher behavior to date indicates that ready access to working equipment and materials is a major factor in use (cf. Cambre, 1985). Ideally, a mechanism for playing video materials should be a standard component of every teacher's equipment, and appropriate video materials should accompany the teacher's manual of every text; video should be as easily accessible as chalk or overheads. A reasonable interim goal for the foreseeable future would be to match the number of television sets with record and/or playback equipment.

ITV Use. Perhaps the most controversial albeit often quoted data from the *SUS* are those reported by teachers about actual use of ITV. These data are represented in Table 3. It should be noted that the analysis is based on the responses of those teachers who reported having ITV available.

TABLE 3: ITV USE BY SCHOOL LEVEL (*SUS* Tables 37, 38)

	Total	Elementary	Middle/JH	HS
Used ITV Programming in 1982-83	54%	56%	51%	51%
Used 1 series	9%	10%	9%	5%
Used 2 or more series	33%	38%	31%	23%
No complete series used	58%	52%	60%	72%

This table can be read with the eyes of the proverbial "two men behind prison bars." If stars are what the readers see, they will note that in 1982-83, 54 percent of the teachers (791,000) reported using ITV, and that better than

half of the teachers at every level of schooling reported some use. If the readers choose to see mud, they will argue that 58 percent of the teachers reported not using even one complete series.

Whether one is optimistic or pessimistic about these numbers, the fact remains that a large number of teachers do use ITV, but that a larger number do not use entire series. This is a tremendously important fact, and one which deserves close attention in future planning and production. As will be seen in the qualitative data reported next, the flexibility afforded by videotape promotes selectivity. It is highly probable that those teachers who are using ITV wisely are choosing those parts of series that relate most directly to their curriculum needs, and not using less relevant programs in a series. It is also desirable that they do so. From a pedagogical point of view, this is to be encouraged and should become a standard feature in the instructional design, production, and curriculum integration efforts for all ITV series. It is noteworthy that in response to another question on the *SUS* survey, a total of 580 different series were mentioned as being used in whole or in part.

Who are the "ITV teachers"? Where are they and what are they doing with ITV? The scenarios that follow are abstracted, hypothetical profiles of ITV-using teachers based on the data of the 1982-83 *School Utilization Study*. They describe the most representative teacher in each category during the 1982-83 school year, as closely as can be deduced from the available data.

Scenario One

Teacher 1 is an elementary teacher in a relatively small, wealthy school district. She has access to both broadcast and VHS-recorded programming. She has a TV set available for her use which is rotated among 5 classrooms. She shares the VCR with 15 other teachers. When she needs something taped she requests it of someone in the school who is in charge of taping. She prefers full-semester or year-long series to be available for her use rather than mini-series or selected programs, but she is more likely to make her own selection of programs from these series than to use a series in its entirety. She is likely to select from ITV materials in reading, health, and science to enrich her teaching. Series she might choose from include "The Electric Company," "Inside Out," and "The Inside Story of Slim Goodbody." She uses about the same amount of ITV that she has in the past three years. When she uses ITV it is usually with her own class, though on occasion she joins with other classes in the school. She uses the Teacher's Guide to prepare pre- and post-viewing activities. She spends 11 minutes "setting up" the program before viewing, and 16 minutes discussing it after viewing. Sometimes she makes related classroom assignments. She wishes there were more ITV programs to enrich her reading curriculum.

Scenario Two

Teacher 2 is a middle school teacher in a relatively small, wealthy school district. She also has access to both broadcast and VHS-recorded programming. She shares a TV set with 8 other teachers, and the VCR with 20 others. There is a videotape library in the school, and in addition to using the tapes from that library she may request to have programs taped for her use. She is not at all interested in using complete series, preferring instead to use selected programs from series. She is most interested in video lessons to enrich her science and social studies curricula, and is likely to choose from such series as "3-2-1 Contact!" and "Assignment the World." She has not changed her use patterns in the past three years. She uses ITV with her entire class group. Like the elementary teacher, she uses the Teacher's Guide to prepare pre- and post-viewing activities. She spends approximately 20 minutes in pre-viewing activities and 24 minutes in follow-up. Sometimes she makes related classroom assignments. She wishes there were more language arts (other than reading) programs to enrich her curriculum.

Scenario Three

Teacher 3 is a high school teacher in a middle-sized, moderately wealthy school district. He has access to both broadcast and VHS programming, but he must share the television set with 10 other teachers and the VCR with 22 others. The equipment is rotated among classrooms on a per-request basis. There is a videotape library in the school and he can use the tapes from that library as well as request that other programming be taped for his use. Like the middle school teacher, he is much less likely to use an entire series than selected programs from a series. Also like the middle school teacher, he is likely to use programs other than reading curricula to enrich his social science and language arts. He is likely to use taped programming from "Nova" and the "National Geographic Specials." He, too, has used about the same amount of television in the past three years. He uses television with an intact class, and uses the Teacher's Guide to prepare the lesson. He spends 28 minutes setting up the lesson with his class, and 34 minutes in discussion after the video. Sometimes he makes related classroom assignments. He feels that more ITV programming is needed in the social sciences and the language arts other than reading.

Why do teachers use ITV? Teachers in the survey reported that students comprehend and discuss content presented in ITV (75%), that students learn more when teachers use ITV (45%), and that students have followed up on ideas mentioned in ITV (41%). Over one-third of the teachers (39%) said students prefer ITV to other classroom media (Riccobono, 1985, p. 32).

Barriers to Use. What do teachers perceive as difficulties associated with using ITV? The most frequently cited difficulty (cited by 32 percent of the teachers who had ITV available) was that of not having programs available

when needed. The second most cited difficulty (24%) was that of not finding out about programs in advance, followed closely by that of not finding enough high quality programs in subject areas (22%). Only 17 percent of the teachers indicated that equipment non-availability was often a problem, with 11 percent indicating that not having good equipment in good condition was often a barrier to use. These data suggest that greater program accessibility and better advertising of programming might allow for more teacher use of ITV, and were more important factors than equipment availability in 1982-83.

Training for ITV Use. A useful and frequently ignored aspect of teacher use of ITV is training for use. Data from the *School Utilization Survey*, Tables 82-88, reveal that only one-third (31%) of all teachers reported having received training in ITV, compared with 60 percent reporting having been trained to use "other media," 44 percent reporting initial training in audio/radio, and 40 percent reporting prior training in the use of computers. The estimated 662,000 teachers with training in ITV reported having received their training as follows:

Preservice (undergraduate)	37%
Selftaught	31%
Inservice workshop (self-selected)	26%
Graduate or continuing education	24%
Inservice workshop (required)	20%

Forty-two percent (42%) of all principals reported having received training in ITV, compared with 54 percent reporting prior training in computers, 49 percent in other media, and 41 percent in audio/radio. Recency of training provides an interesting set of data. Of those principals reporting training in a medium, only 44 percent reported receiving training in ITV within three years of 1982-83, while 95 percent reported receiving training in computers within that time frame. Although teachers were not asked the same question, a similar pattern can be assumed.

Support and Encouragement

Since ITV is, in most if not all cases, used voluntarily, support and encouragement are extremely important factors contributing to its use. Again, interesting data regarding support and encouragement are provided in the *School Utilization Study*.

Budget. Budgets and sources of funding for instructional media in 1982-83 are represented in Figures 2-4.

FIGURE 2

Total District Media Budget Allocations

as Reported by Superintendents

(Table 64, SUS)

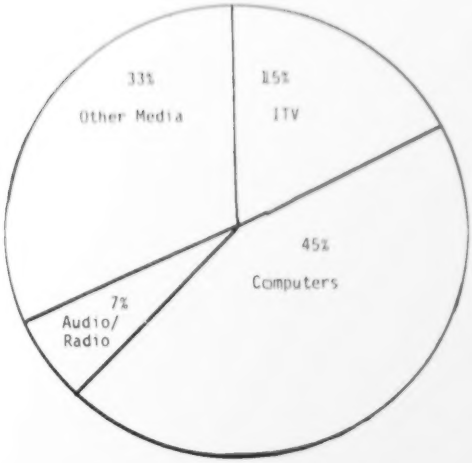


FIGURE 3

District Sources of Equipment Funds for Instructional Media

as Reported by Superintendents

(Table 66, SUS)

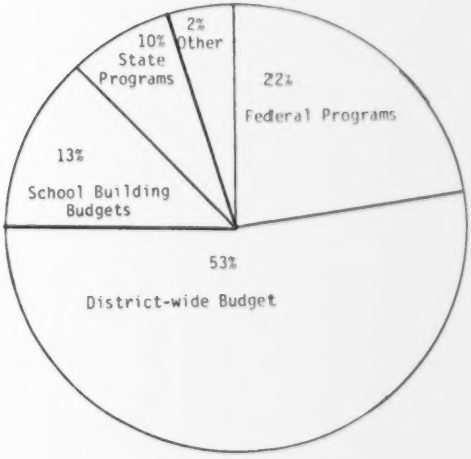
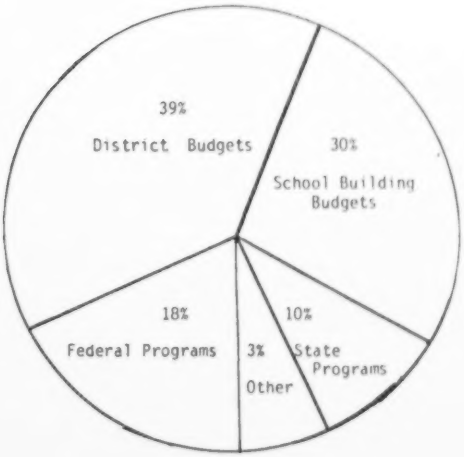


FIGURE 4

School Sources of Equipment Funds for Instructional Media

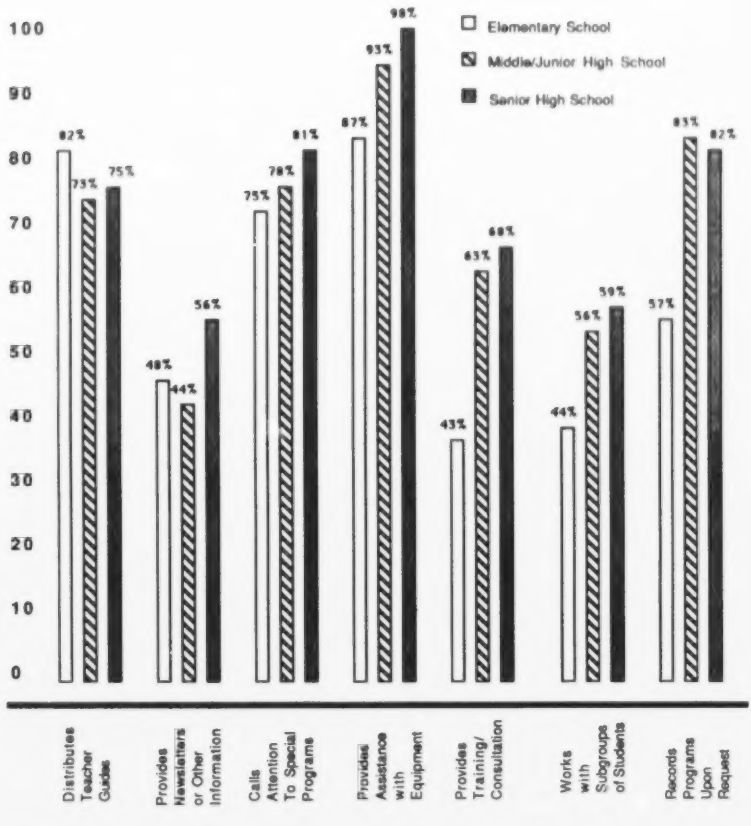
as Reported by Principals

(Table 67, SUS)



From these data it is evident that ITV was not given adequate district funding in 1982-83, especially compared to the support given computers during the same time frame. To emphasize this point even further, 92 percent of the superintendents with computers available reported an increase in per capita financial support for that medium from 1980 to 1983, while only 42 percent of the superintendents with ITV available reported an increase. Another 41 percent of the superintendents reported that the ITV budget allocation had remained the same over the three years, and 12 percent reported a decrease in per capita allocations for ITV (Table 65, *SUS*). Although comparable data are not available, there is reason to suspect that this picture has changed slightly in ITV's favor in the past two years. Hayes (1986) reports a significant increase in the number of VCRs in schools, as shall be seen shortly.

Figure 5
Percentage of Schools Reporting All Services Provided by Building-Level ITV Coordinator (by school level) (SUS, 1982-83)*



* Data reported by principals of schools with building-level coordinators available (Table 73)

Personnel. Half of the school districts with available ITV programming reported having district-level personnel responsible for ITV, and only about 20 percent of that person's time was devoted to coordinating ITV. Fifty-five percent (55%) of the schools in this country with ITV availability had building-level ITV coordinators in 1982-83, and 79 percent of those coordinators were trained in media. High schools were more likely to have ITV coordinators (71%) than were middle and junior high schools (61%) or elementary schools (51%). Almost all (99%) ITV coordinators had other responsibilities, with library being the most frequently mentioned (67%), followed by other media (excluding computers and audio/radio) responsibility (34%), and teaching (32%) (Tables 68-74, *SUS*).

Services provided by school building ITV coordinators differ by school level. These are illustrated in Figure 5.

It should be noted that, in general, high school ITV coordinators are more apt to provide support services necessary to ITV use than are middle school or elementary school ITV coordinators. This is in part the result of more specialization on the part of high school ITV coordinators, whose other jobs tend to be focused on library/media duties rather than on teaching or administration. It might also be the result of training, as 91 percent of the high schools with building-level ITV coordinators reported that their coordinators had media training, compared to 75 percent of the elementary schools reporting having media-trained ITV coordinators.

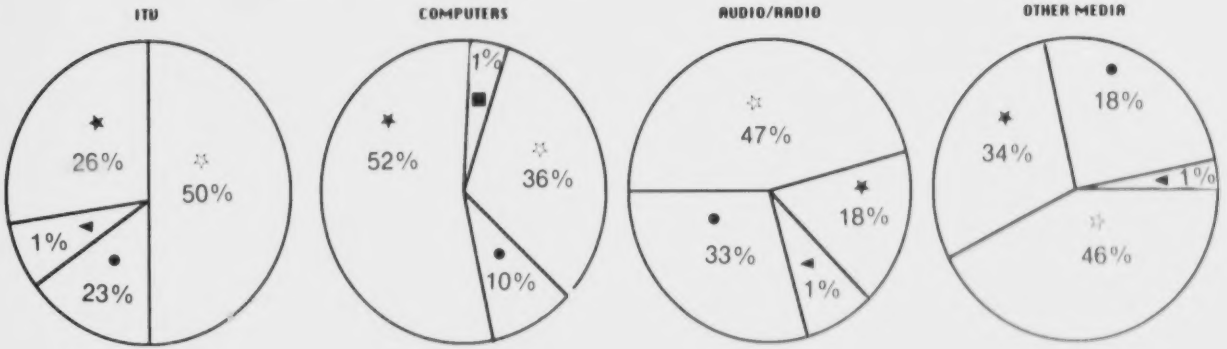
It appears that schools see the function of elementary-level ITV coordinators as distributing teacher guides and assisting with equipment, and to a much less extent recording programs and performing the other services mentioned. This is in contrast to the apparent interpretation of the high school ITV coordinator's role, which tends to be primarily defined as providing assistance with equipment, recording programs upon request, and calling teachers' attention to special programs.

Encouragement. There are many ways to encourage the use of media in schools, one of which is to provide inservice training.

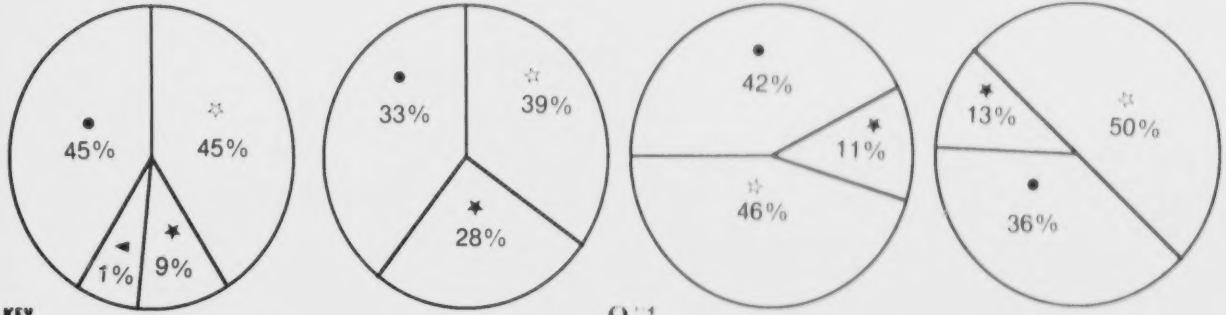
Superintendents report that inservice workshops for training teachers in the use of ITV were available in 50 percent of the school districts in 1982-83. This is in contrast to 84 percent of the districts reporting the offering of training in the use of computers at that time.

Another measure of encouragement is the perceived attitude of administrators toward media. The *School Utilization Study* measured principals' perceptions of district practice regarding use of media, and teachers' perceptions of principals' attitudes toward use of media. These perceived attitudes are contrasted in Figure 6.

Figure 6: Principals' Perception of District-Level Encouragement+



Teachers' Perception of Principals' Encouragement



KEY

- ● Use neither encouraged nor discouraged
- ■ Use strongly discouraged
- ◄ Discouraged but left to discretion of schools/teachers
- ☆ Encouraged but left to discretion of schools/teachers
- ★ Use strongly encouraged

+ Data taken from tables 89 and 90 of SUS Report

Figure 6 illustrates that principals perceive more encouragement from district-level administrators to use media than they seem to pass on to teachers. It also reveals a rather "cool" attitude toward ITV on the part of principals as perceived by teachers, as fewer principals are perceived as strongly encouraging its use than that of any other medium, and more are perceived as taking a neutral position.

The good news is that use of ITV is not perceived to be strongly discouraged at either level, and that only 1 percent of the administrators at each level discourage use but allow it to be discretionary.

Given this atmosphere, the advances made by the ITV profession over the years are quite remarkable. In the next few pages the penetration of ITV into the school will be examined from a longitudinal perspective.

Changes in ITV Availability. It is clear that ITV has become increasingly available through the years as a result of technological advancements, programming availability, and hard work. Figure 7 represents the data collected during the *School Utilization Studies* of 1977 and 1983 regarding ITV availability.

While the percentages of districts and schools reporting ITV availability increased dramatically and significantly between 1977 and 1983, this increase was not reflected by teachers in their report of classroom ITV availability. These data are corroborated by the longitudinal data on ITV use during the same time period. In 1977, 59 percent of all teachers with ITV available reported using it. By 1983, that figure had dropped to 54 percent, with the biggest drop-off being among elementary teachers (*SUS*, Table 104).

This apparent decline in classroom availability and use of ITV parallels the strong push for computer use in schools, and probably represents one "fallout" of the computer movement. A comparison of the data in Figure 7 with those in Figure 6 confirms the fact that, while administrators thought they were supporting ITV, their support of computers was much stronger, especially in the eyes of teachers. It also reinforces the availability/accessibility issue discussed earlier.

Figure 7
Changes in ITV Availability, 1977-83
(*SUS* Tables 93, 95 and 96)

% of all units with ITV Available		50% 60% 70% 80% 90% 100%
Districts (Reported by Superintendents)	1976-77	XXXXXXXX 73%
	1982-83	XXXXXXXXXXXXXXX 91%
Schools (Reported by Principals)	1976-77	XXXXXX 71%
	1982-83	XXXXXXXXXXXXXXX 94%
Classrooms (Reported by Teachers)	1976-77	XXXXXXX 72%
	1982-83	XXXXX 70%

There were significant increases in three methods of ITV reception at both the district and the school levels from 1977 to 1983. These increases were in (1) direct broadcast from commercial television (17% increase at school level), (2) cable television (25% at school level), and (3) videotape or cassette (35% at school level). Figure 8 illustrates the rate of increase of videocassette equipment in the schools based on available data from the *School Utilization Study* (Riccobono, 1985) and the Quality Education Data (QED) Company's research report on microcomputer and VCR usage in schools (Hayes, 1986).

In the QED report, Hayes offers several reasons why VCRs are becoming popular in schools, including cost, flexibility, and familiarity. Her analyses parallel what other researchers have found to be factors influencing teachers' use of media, i.e., prices for recorded videocassettes are much lower than for film and continue to drop, and the same is true of the hardware. This means that schools can now better afford to buy both equipment and software and make them available for classroom use. And some commercial producers such as the National Geographic Society are cooperating by allowing their programs to be taped free of charge for instructional use.

VCRs also eliminate some of the multiple problems inherent in trying to use broadcast television by providing flexibility both in scheduling and in teacher control over the video lesson. And teachers are becoming more and more familiar with VCRs as this technology permeates American homes. Since ease of use is a prerequisite for classroom acceptance of technology, this becomes another convincing argument for VCRs as appropriate classroom tools.

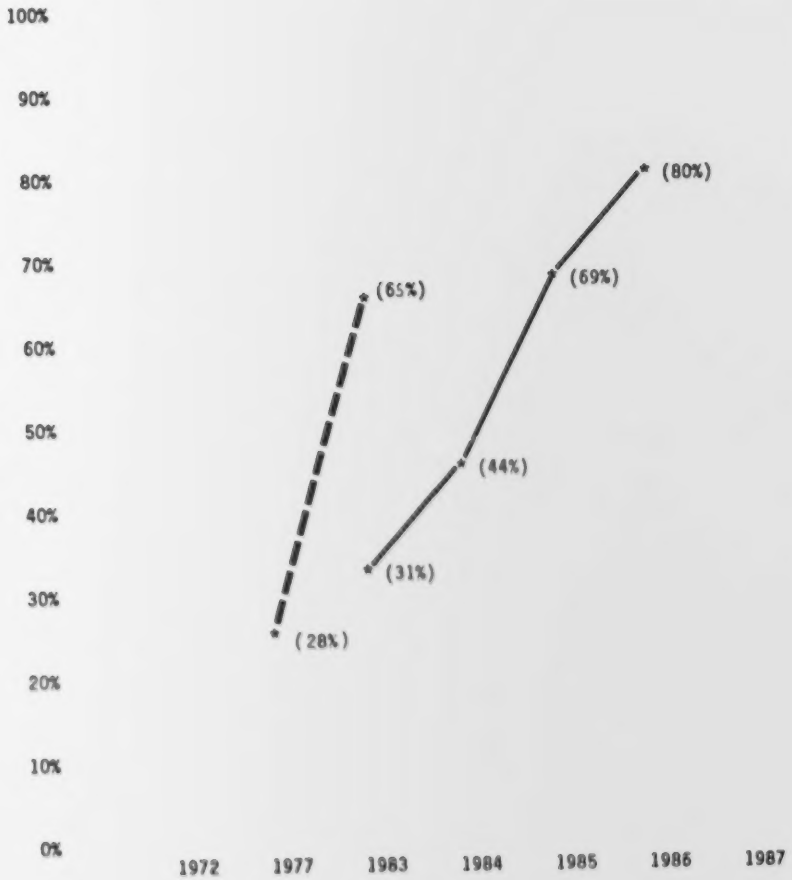
Qualitative Data

While a national survey provides useful statistical data and a more or less accurate suggestion of the larger picture, much more interesting information can be gathered, albeit more tediously, by talking to people in the "trenches." This is what AIT set out to do when it commissioned seasoned author and journalist Robert Carlisle to find out how and why teacher advocates of ITV use the medium in their classrooms. The result is a fascinating account of his interviews published by AIT in a book entitled *Video at Work in American Schools* (Carlisle, 1987). This is inspirational reading for anyone interested in ITV who is perhaps disheartened by the negative press it has received of late, and for those whose perception of it is that ITV is a failed medium.

Despite his disclaimer that this was "in no way a clinically pure, national survey," Carlisle employed a legitimate naturalistic and journalistic research methodology to gather data about actual cases of ITV use from 158 subjects in 12 states and 70 communities in this country. There were 83 teachers in the sample averaging 16 years experience, 45 administrators, and 30 media coordinators. It is impossible to adequately summarize this anecdotal tour of ITV across America, so the reader would be well advised to obtain a copy of the narrative.

Figure 8

Changes in VCR Availability



----- represents % of schools with ITV available as reported by principals (SUS, Table 98)

_____ represents % of all schools (Hayes, 1986, p. 52)

Equipment. Carlisle focuses his story around what he calls a "troika of elements on which video depends" (p. 41), the three elements being equipment, programming, and support. Carlisle saw firsthand what was uncovered by the national surveys discussed above: videotape recorders and playback machines have penetrated the schools in record numbers, and teachers are finding ways to make them work in the accomplishment of their goals. He found more and more schools building video libraries, noting as an example that for the first time in its history, television station WVIZ reports that over 50 percent of the Cleveland schools are stockpiling recorded tapes. Teachers have set up "learning corners" in their classrooms in which the videotape deck is used with earphones by individuals or small groups of students for basic instruction, remediation, or enrichment. Media centers/libraries stack videos along with books to be used as references for assignments, or to be viewed by students who were absent the day a program was shown in class.

One teacher tells of an enterprising high school senior in New York State who wanted to take a Shakespeare course but couldn't schedule it. She arranged with the teacher to view the BBC Shakespeare plays on cassette either at home or at school, meet with the teacher on several occasions, complete appropriate tests and papers, and get credit for the course. A teacher in South Carolina recalls that she wanted her class to watch Robert McNeil's "The Story of English," but that it was not broadcast at a convenient time. One of the students in the class recorded it at home, and some of the class watched it on tape on a Sunday afternoon. These are not extraordinary stories. In thousands of classrooms, teachers and students are finding good instructional programming and new ways to access it to enrich their educational experiences.

Like others before him, Carlisle found ease of use, flexibility, reliability, transportability, and affordability to be the features attracting teachers to videocassette use.

Programming. Regarding programming, Carlisle writes, "Listening to field comments of teachers . . . one deduces that finding video programming of good quality no longer is a pervasive problem" (p. 40). The teachers interviewed reported using programming in virtually every area of the curriculum and on every grade level. Many of the well over 500 ITV series now available to teachers were mentioned by name.

Carlisle reports that a number of teachers he interviewed talked of how video can reinforce instruction for children who happen to learn best from visual sources. This is arguably one of the more important points to come out of these interviews, and one which should be noted in planning for the future. Teachers told of science series giving visual explanations of physics and chemistry (p. 24), of math series that "visualize things that kids have trouble visualizing" (p. 27), and of videotapes that "help kids to better understand things by enabling them to visualize them" (p. 24).

Carlisle's research revealed that ITV programming is also being used to reinforce classroom instruction, to expedite change, to diversify teaching, and to improve access to education for home-bound students, students in

remote areas, and students who for one reason or another do not have access to regular classes.

Support. Carlisle sees strong support, "putting enough human resources into helping teachers make the most of the video that is out there for them" (p. 60), as the crucial element in ITV use. He cites schools in which video is used extensively because of the extraordinary efforts of one person, usually a media director. One such facilitator told Carlisle, "Teachers are up to their ears in paperwork and discipline and teaching to the text, and this is just one more thing that they have not had an opportunity to internalize into their teaching system. They really need the opportunity to see how this could help them get where they are going, rather than seeing it as an aggravation" (p. 41). Sometimes the ITV advocate is a teacher who, through his or her own judicious use of the medium, influences other teachers to do likewise. The overwhelming impression conveyed in Carlisle's book is that there are many enthusiastic individuals in every part of the country who, largely through their own convictions and efforts, have harnessed the support necessary to make ITV work for them.

An ideal support system has four primary roles, according to Carlisle's observations: (1) it makes equipment and programming available, (2) it provides program information, (3) it offers inservice training, and (4) it encourages video activity.

Carlisle describes how each of these roles has been carried out by enterprising individuals at every level from remote school districts in Wisconsin (which, largely through the effort of one supervisor of libraries and media, moved from owning two VCRs for the whole school system in 1979 to owning 131 in 1987), to the highly sophisticated ITV system in South Carolina which has in place 2,165 VCRs, up 22 percent from the year before.

After equipment is in place, the task is one of informing and promoting. Carlisle notes that ITV advocates have multiplied their enthusiasm for using ITV to improve teaching and learning throughout the country through newsletters, curriculum correlations, traveling utilization workshops, and pure commitment and dedication.

Carlisle also identifies nine strata of support systems at work in the schools of this country in which he observed ITV in good use. The first of these is support from statewide systems. He describes the relatively new ASSET (Arizona School Services Through Educational Technology), in which 12 state-level teacher trainers go right to the schoolhouse doors of the state to sell their burgeoning ITV services (with outstanding success over the past three years); the New Jersey Network (NJN), which blankets the state and has recent figures indicating that 42,000 out of 75,000 teachers use ITV; the venerable South Carolina instructional television operation, soon to celebrate 30 years in the business and reporting that ITV is used by 44 percent of the teachers in 93 percent of the schools for 77 percent of the students. (This translates from a growth of 676 schools making use of ITV in 1969-70 to 1,031 schools doing so in 1985-86, and a current total of 16,496 teachers actually reaching 464,586 students with ITV programming); and the State of Wisconsin's Educational Communications Board, which delivers an ITV

signal to 100 percent of the state with six regional unit service directors serving as the link to the state's schools. Almost every state has some level of ITV coordination, and there are many more outstanding ones than Carlisle was able to visit.

The second stratum of support Carlisle identifies is support from public television stations. He visited three of the many public television facilities with real commitment to ITV: Buffalo's WNED-TV, San Francisco and Northern California's KQED, and Cleveland's WVIZ. In each of these facilities, strong personnel have been hired to encourage the use of ITV in schools, and in each instance, initiatives to encourage video libraries at the local level have resulted in increased utilization. WVIZ reports that well over 60 percent of the teachers in its viewing area are using ITV in the course of a school year.

Support from regions of states is the third support system Carlisle identifies. By regions of states he means intrastate organizations that serve as links between state and national bodies and individual schools. As examples he mentions the 40 BOCES (Boards of Cooperative Educational Services) units in New York State, the seven ITV regions in California, South Carolina's 14 distribution centers, and Wisconsin's Regional Service Units. In each instance, and in many more like them that Carlisle did not visit, capable staffs are dedicated to getting ITV resources to the schools of their areas.

Three of the support systems Carlisle identifies are at state and/or district administrative levels: support from district superintendents' offices, support from curriculum coordinators, and support from district media coordinators. In each instance, he describes administrators who are perceived as ITV advocates and who have been responsible for spreading the use of the medium. For example, an associate superintendent of instruction in Missouri made video a reality in a short period of time. A supervisor of physical education, health, and recreational safety for the Department of Education in Minnesota reaches school administrators and teachers across the state with the message that teaching strictly from textbooks "is really a deadly way to motivate kids to be concerned about their health" (p. 53). District media coordinators in Wisconsin, New Jersey, Missouri, and Ohio are spotlighted as major contributors to their respective districts' high level of ITV use.

Finally, Carlisle mentions three building-level support systems that can facilitate the use of video technology: (1) support from principals such as one he met in Tempe, Arizona, and another in West Columbia, South Carolina, who promote ITV in their schools because they believe it enhances learning; (2) support from building-level media specialists (and Carlisle met many across the country), perhaps the most critical element in enabling teachers to use the medium; and (3) support from teachers themselves. Teachers, by the example of outstanding work in their own classrooms, by informal conversations with their colleagues in lunch rooms, and by teacher-to-teacher workshops, are also making significant contributions to the use of ITV as documented in Carlisle's book.

The message of Carlisle's experiences is that there is, indeed, a respectable amount of exemplary activity in this country in the use of ITV in the schools.

In fact, his research shows that far from being a dead medium, ITV is alive and well in many of the outstanding schools of this land, and that people have been remiss in the past to ignore, or worse, contradict this in public forums.

Fantasies

So wherefore the rumor that ITV is a failed medium? Once upon a time in the 1950s and 1960s, enthusiastic educational technologists recognized the promise of the young television medium and saw visions of its transforming the troubled schools of the day. These visions were epitomized by the much publicized statement of an Educational Media Study Panel in 1961:

> The advent of television and, indeed, the whole complex of newer communications media (from videotape to satellites) has given American citizens unparalleled opportunities to advance in their ability to record and communicate ideas. These new communications resources must now be harnessed to serve the ends of education in a time when American school and college programs must now find new and improved ways to cope with spiraling enrollments and increasing shortages of adequate classrooms and able teachers, as well as the new educational needs created by the explosions in knowledge and by the changing world conditions which threaten national survival.
>
> The new media and devices now available to education hold as much promise for improvement of instruction as did the invention of the book. (*Educational television*, 1962, pp. 11-12)

Fantasies about media bringing happy-ever-afterness to education were not new, even in 1961. Thomas Edison, upon inventing the motion picture, predicted it would revolutionize schooling. When these types of promises and predictions about media fail to materialize, folkloric ballads are sung of the disappointing medium's demise. It is time to demythologize notions about ITV's place in education. It is time to acknowledge that universal use of anything in this conglomerate called schooling is an unrealistic goal. It is time to admit that there is a respectable amount of instructional television in use in today's schools and every reason to expect continued growth. To suggest anything less is to distort reality.

Some researchers' opinions notwithstanding, much has been learned about ITV and about learning from television in general through the 30 or so years of ITV research. It has been established, unequivocally and irrevocably, that a well-designed and produced television program can and does teach. This is especially verifiable when the potentials of the medium are exploited and content visualization is maximized. It is most especially true in the hands of a skilled teacher.

Another significant point that has been established once and for all is that media comparison studies as exemplified by the question "Does it teach better than . . .?" are generally uninformative and inappropriate. As Salomon and Gardner (1986) put it, "stripping the medium down to its bare bones (the experiment wouldn't be perfect otherwise) affects nothing in and of itself" (p. 14). The classic example of this type of controlled comparative study is the comparison of the live teacher to the video-transmitted image of that teacher, with all other things being held constant. This, of course, is an appropriately controlled experiment but is not a test of the effectiveness of instructional television. Happily this point no longer needs to be labored and the media comparison studies that continue to find their way into the literature can for the most part be disregarded.

Three productive types of inquiry activities have been employed to date in studying educational and instructional television: basic research, formative evaluation, and impact studies. In the remainder of this chapter each of these will be examined in turn.

Basic Research

Basic (and sometimes applied) research seeks to determine the effects of the medium or aspects of the medium on the intended audience. For years social science researchers and psychologists have investigated the effects of television on children. Effects are typically measured in three areas: knowledge, attitudes, and behavior. Some researchers have used experimental research methodologies to isolate and manipulate particular television attributes in an attempt to determine their effects. Dorr (1986), Howe (1983), Meyer (1983), and Bryant and Anderson (1983) provide excellent overviews of this research.

The most notable example of the basic research approach to the study of television has been the "formal features" work led by researchers at the Center for Research on the Influence of Television on Children at the University of Kansas. Psychologists Aletha Wright and John Huston and numerous others following their lead have created a taxonomy of formal features of television that theoretically contribute to attention, comprehension, and learning. In turn they have systematically explored the effects of these features. For example, Rice, Huston, and Wright (1983) list five findings repeatedly emerging from research on visual attention to television forms:

- Auditory features, such as lively music, sound effects, children's voices (but not adult dialogue), peculiar voices, nonspeech vocalizations, and frequent changes of speaker attract and hold children's attention.

- Conventional visual features, such as cuts, zooms, and pans have less influence, but visual special effects do attract children's attention.

- In most studies, high levels of physical activity or action elicit and maintain children's attention.

- Changes in scene, characters, themes, or auditory events are especially effective in eliciting attention, though they are less important for maintaining it once the child is looking.

- Features that lose children's attention include long complex speeches, long zooms, song and dance, men's voices, and live animals. (p. 31)

It is important to note that most (though not all) of the studies from which these findings emerged were conducted with young children. Older children and adults are generally less sensitive to formal features, though they do react to special effects, sound effects, and unfamiliar scenes. It should also be noted that many of these studies were conducted with commercial programming or educational programs such as "Sesame Street" and "Mr. Roger's Neighborhood." Some researchers use as their stimuli programs that more nearly fit the definition of instructional television, with sometimes conflicting results. Such was the case with Wakshlag (1982), who studied the effects of background music in educational programming. He found that although slow-paced music had negligible effects on attention and information acquisition, fast-paced, rhythmic music, especially when appealing, reduced visual attention.

Educational psychologists add to the social scientists' interest in what the formal features or symbol systems of a medium communicate by examining the interaction of those media characteristics with cognition. From an educational perspective, the most widely acclaimed finding in this regard is Salomon's claim that he could use the television zoom to supplant the skill of relating whole to part or part to whole (Salomon, 1979). Unfortunately Salomon did not pursue this line of research further, and there are few similar data regarding the direct effects of other formal features or characteristic attributes of television on cognitive skills. Neither is it known whether Salomon's data will generalize to all children's use of television in all contexts. Salomon himself raises the issue and suggests that uniform effects should not be expected. Salomon and Gardner (1983) suggest that, as past research has shown, media researchers can expect strong interactions with a variety of individual differences. In addition, the possibility must be considered that the same treatment is differentially experienced and may lead to different outcomes (p. 17).

Salomon's more recent research also has direct implications for ITV. It is based on the assumption that previous television viewing experiences and

social cues surrounding the viewing of television affect the Amount of Invested Mental Effort (AIME) in a negative way; that is, that people invest less effort in mentally processing television and apparently learn less from it because it is perceived to be "easy" and "like real life." Salomon also compared the effects of learning from print and learning from television. Unlike most media comparison studies, this one was designed to retain the symbol-system uniqueness of the two media under investigation (Salomon and Leigh, 1984).

In a sequence of investigations these researchers found that (1) children's general perceptions of the mental demands required by TV and print are reflected in the amounts of effort they report expending when they encounter a specific TV story or its comparable version in print, and that (2) the Perceived Demand Characteristics (PDC) a learner brings to an experience can be manipulated, e.g., PDC-LEARN or PDC-FUN, to facilitate greater expenditure of effort, thereby eliciting greater learning from television.

An interesting study which deserves replication examined the influences of direct instruction on student learning by comparing the results of using two different versions of an ITV program. O'Loughlin and White (1982) compared a randomly selected program from the science series "Odyssey" with a revision of the program in which the commentary had been altered to include at least five principles of direct instruction. These principles were: (1) provision of clear goals, (2) extensive content coverage, (3) easy-to-difficult sequencing, (4) reviews, and (5) cues for attention-focusing. Results indicated that children exposed to the experimental version scored significantly higher on the posttest. It appears that ITV design and production would be well served by further investigations along these lines, including the effects of such alterations on appeal.

In their continuing studies on the effects of humor on information acquisition from educational television programs, Zillman and his colleagues (1984) have found that humor aids greatly in attracting children to educational programs and that it is capable of facilitating the acquisition of educational information, probably by producing a watchfulness that overrides fading attention. Young children are very accepting, even of humor that is unrelated to the content it embellishes, but this effect is inversely related to age. For older students, humor should be well integrated with the educational materials to enhance student-teacher rapport and produce positive learning effects. Zillman et al. also caution that humor can be counterproductive if it is not well understood, e.g., they found that humorous distortions of educational points can produce perceptual distortions in children up to the fourth grade level. They suggest that this is especially significant in television programming to which selective attention is the norm. Children are likely to focus on vivid, humorous distortions, but not on the subtle qualifications that might be conveyed simultaneously. In earlier research, Canton and Reilly (1979) found that the use of well-integrated humor couched in verbal irony was counterproductive when it contradicted the educational information being presented.

Formative Evaluation

By its very nature formative evaluation is a private activity, conducted within and for the development team to determine the effectiveness of a particular product. It has a long tradition in educational and instructional television (cf. Cambre, 1981) and continues to be an important component of most funded ITV projects. Most formative evaluation reports are in-house documents meant only for those in a position to improve the product. Some formative evaluation summaries, notably those conducted by the Children's Television Workshop and the Agency for Instructional Technology, are shared with the public for the insights they provide about programming variables as well as about formative evaluation methodology.

If it were possible to accumulate all of the formative evaluation data produced over the past 30 years of instructional television's existence, the results would impress even the staunchest skeptic. Through formative research and evaluation, educators have learned where and when to put words on screen to reinforce concepts; that the dramatic format works best to maintain attention and interest in elementary students; that children identify with characters slightly older than themselves; that advance organizers, repetitions and summaries are important for comprehension and retention; and on and on.

Much of the wisdom about ITV production acquired during formative evaluations resides in the heads and files of experienced producers, designers, and evaluators rather than in formulated guidelines. There is a hesitancy to "institutionalize" formative results for a variety of reasons, not the least of which is the conviction that creativity plays as important a role in the success of instructional television as do established design and production formulas.

Thus the formative evaluation literature tends to focus on methodology (e.g., Mielke and Chen 1983, and Rockman 1983), and provides less in the way of generalizable effects. There is a need to study the numerous specific formative evaluation reports that now reside in in-house files to extract from them findings about ITV effectiveness that might be shared with the entire field. As Mielke and Chen (1983) point out, the interaction of topic appeal and method of presentation will always confound formative research findings, and caution must be exercised in generalizing beyond the specific product under scrutiny. (This is a problem inherent in media research in general, not just in formative research.) One solution is to share and accumulate formative data until generalizations can be made across a number of different contexts. Baggaley (1986) illustrates how information can be derived and applied across several formative evaluation studies while at the same time allowing the creative freedom of the television producer to be preserved.

Formative evaluation and research findings for major series such as "Sesame Street," "Inside/Out," "Self-Incorporated," "ThinkAbout," "Voyage of the MIMI," and "3-2-1 Contact!" have been shared to a relatively widespread degree with the field. By way of example, among the formative research findings reported by Mielke and Chen during the first years of "3-2-1 Contact!" research was that of format preference. The dramatic format stood out as a clear preference for 8- to 12-year-old children, corroborating earlier formative research conducted by the Agency

for Instructional Technology. "3-2-1 Contact!" researchers also found that children of this age tended to process visual information primarily and audio information secondarily, did not view as didactic the "headlines" that provided explicit connections between segments, and appreciated opportunities to laugh, especially during animations. CTW researchers were convinced that a science series could be built around children conducting an earnest investigation of interesting phenomena based on data collected from children of the target age who displayed a coexisting appetite for realistic documentary films, as well as those containing dramatic conflict, fast-paced action, and situation comedy (Mielke and Chen, 1983).

During the "Self-Incorporated" evaluations, researchers found that standard television production conventions must be employed when moving backward and forward in time and in and out of reality, that "all talk, no action" scenes reduced levels of attention and occasionally interfered with comprehension, that the race of the actors was not a factor in the perception of or effect of the programs, and that students in the sample rejected solutions to problems proposed in the programs when they called for active rebellion against authority figures. The researchers also found that teachers were sometimes reluctant to deal with the personal issues raised in some of the "Self-Incorporated" programs, and that students felt more at ease discussing these issues. These and other findings helped producers and designers alter on-screen events and enhance printed guides and inservice activities for teachers to assist pre- and post-viewing discussions (*Formative Evaluation*, 1976).

The contributions of formative evaluation and research to our knowledge of instructional television's effectiveness must not be minimized. Accumulating data continue to cry out for synthesis and publication as evaluations increasingly become standard features of the instructional design process.

Impact Studies

Numerous studies have been conducted to determine the impact of ITV series once they are in use or to describe the circumstances of use. These studies are sometimes carried out as summative evaluations or field tests during the first or second years of release, although Rockman observes that teachers use series with maximum effectiveness only after the first or second year (Rockman, 1983). Many of these studies are conducted for the purpose of persuading funders to continue contributing to a worthy cause, while others are motivated by research interests sparked by a hunch that something important is happening. Some, as Johnston (1987) points out, are conducted as the result of pressure from the very people who wanted the series created.

AIT's "ThinkAbout" has been the subject of several effectiveness studies and is an excellent example of the problems inherent in conducting such studies under pressure to prove a point. "ThinkAbout" is an unusual ITV series in that it is cross-disciplinary, very large in scope (60 15-minute programs), and designed to strengthen the basic thinking skills of fifth and sixth graders. The magnitude of the series, combined with the uniqueness of its

content (teachers and researchers are not used to dealing with thinking and reasoning skills across traditional content areas), put an added burden on researchers to "show that it works." An unrealistic and unwarranted criterion was used to determine the effectiveness of the series: improved scores on the California Test of Basic Skills. Needless to say, exposure to "ThinkAbout" programs did not influence students' scores on that standardized test, and the most researchers could say was that it improved thinking and reasoning skills to a very limited extent based on series-specific instruments (Sanders and Sonnad, 1982; Sanders, 1983a).

A more productive series of studies on "ThinkAbout" employed qualitative research methodologies to determine how the series was being used in classrooms under natural conditions. Six case studies were conducted in classrooms in Missouri and Oregon where the series was in use. Researchers employed participant observation and interviews to generate their research data. One of their purposes was to discover contextual factors (context being defined as the milieu in which instructional television is provided) that appeared to influence the impact the series had on students (Sanders, 1983b).

Sanders provides a comprehensive description of contextual influences the researchers discovered during the "ThinkAbout" case studies, including: (1) the school organization, such as pressures of accountability, the school schedule, and unscheduled interruptions; (2) the teacher, including preparation, teaching style and enthusiasm; (3) the teaching process as an adjunct to the series itself; (4) the students, including their attitudes toward television as a learning medium and their expectations for television programs; and (5) influences of the distribution system such as dependency on PBS schedules and delays in receiving copies of the teacher's guide. Sanders makes the point that the researchers learned far more about individualized effects of "ThinkAbout" by their participant observations in classrooms than they could ever have learned by way of measurement instruments or teacher surveys (Sanders, 1983b).

ITV impact studies run a wide gamut of rigor, from in-house surveys of teacher users requesting their perceptions of how a series is working (cf. *It Figures*, 1984) to carefully controlled, third-party experimental research. In some instances multiple studies are conducted and the results synthesized in a style resembling but not equivalent to meta-analysis. This approach is extremely useful, as it yields data from many sites collected under different conditions. The most notable examples of a multi-study approach to measuring a series' impact are those surrounding the economics series produced by AIT in cooperation with the Joint Councils for Economic Education.

"Trade-Offs" spawned numerous studies, 15 of which have been summarized by Shea (1980). These 15 studies, employing a diversity of designs, instruments, and variables, provide a comprehensive look at the series in actual use settings. Each of the studies summarized yielded positive results, leading Shea to five conclusions:

- The series significantly improves students' knowledge of and attitudes toward economics.

- The series significantly improves teachers' attitudes toward economics.

- Student cogni.ion and attitudinal gains were further increased with teacher inservice training.

- Teacher attitudinal gains were further increased with inservice education.

- The series is appealing to students, teachers and administrators. (Shea, 1980, p. v)

Although a synthesis is not available at this writing, a number of studies have been conducted to determine the impact of the economics series for the high school level, "Give and Take." Two separate studies using a similar research design yielded the same results: both eighth graders and high school students who viewed "Give and Take" with a teacher trained to use the series scored significantly better on measures of knowledge of economics concepts than did students who viewed the series without a trained teacher, or who were taught in the traditional manner, or who had no economics classes (Harris, 1985; Holyoak & Harter, 1985).

In 1985, CTW mounted an impact study of Series IV of "3-2-1 Contact!" Researchers at one site found that the shows did teach science concepts, and that in many instances there was an increased interest in science careers and related topics after the programs were viewed (Cambre & Fernie, 1985).

Numerous other impact studies could be cited if time and space allowed. Many of these are noted elsewhere, for example in Bryant, Alexander, and Brown (1983), who summarize the effectiveness of all of the Children's Television Workshop's series and of other educational television series such as "Freestyle," "Carrascolendas," "Vegetable Soup," and "Infinity Factory."

Other Research Questions

Educational media researchers have recently been led into a debate about whether media are "mere vehicles" for learning, or whether they actively impact learning. Although the rhetoric surrounding this issue tempts one to characterize it as "mere semantics" that serve dramatic effect more than substance, the controversy has rekindled thinking about the kinds of questions that still need to be asked and answered regarding the effects of mediated instruction in the classroom.

It is within the context of this debate that Winn made the statement about instructional television quoted in the introduction to this monograph. He suggests that we should have directed our attention to "the instructional methods that users of television might employ with students," "the settings in which instruction takes place," and "the cognitive processes it engages through the use of symbols" (Winn, 1987, p. 46). These are fine suggestions, marred only by the later implication that it is too late to do anything about

instructional television, which has "lost favor" and is no longer "current" as computers are. One would hope that, of all people, the present editors of the research journals in the field would recognize the vitality of ITV and encourage further research along the lines that have been suggested.

Other research questions that seem to be neglected in media research are those relating to when and how to visualize instruction. Lip service is given to the importance of educators' meeting the needs of all types of learners and of the capability of instructional media to help them do so, but research with instructional television has failed to show in a specific or convincing way how visualizing abstract concepts or complex phenomena facilitates the achievement of this goal.

In conclusion, throughout the 30 years or so since television has been available in schools, researchers have consistently found that it does, indeed, "teach," sometimes as well as and sometimes better than traditional methods. So the question of whether students can learn from television is no longer relevant. It is known that they can and do learn, both intended and incidental content, both skills and behaviors, both facts and fictions. It is also known that good instructional television can motivate and stimulate an interest in what children need and ought to learn. Finally, it is known that the better designed and produced the television lessons are, the better students will learn from them.

INSTRUCTIONAL TELEVISION ISSUES AND FUTURES

An appraiser of ITV in 1987 would be remiss not to acknowledge and examine the flurry of activity in the field at the present time. In 1985 a group of ITV practitioners convened to identify the major issues facing the field in order to plan directions for the future. They became known as the ITV Futures Planning Group. Underwritten largely by the Corporation for Public Broadcasting, the group included administrative officers of the three regional networks, administrators from the Corporation for Public Broadcasting and the Public Broadcasting Service, and directors of selected ITV operations at the state and local levels. Their charge was to provide "a means of staffing the work necessary for systemwide consideration of issues facing learning technologies in the future" (ITV Futures Planning Group, 1985, p. ii-3). A five-year planning effort was launched.

The first significant decision was to abandon the term "ITV" as too generic and "with as many meanings as there are players" in favor of the term "learning technology" as a more accurate description of what ITV has become. They define their domain as electronic learning technology:

> That which is used to address major and fundamental needs throughout education. It serves as a central means for the creation and provision of instructional materials and services that are demonstrably effective with students and teachers, that incorporate economies of scale and that integrate all relevant electronic means for designing, producing, distributing, retrieving and evaluating instructional materials. (ITV Futures Planning Group, p. iii-1)

Their philosophy statement creates a strong sense of *deja-vu* for those who have lived through or studied the history of technology. They claim that the time has come once again to speak of technology replacing the teacher:

> Fortunately, the need to maintain the delicate balance [between teachers and technology] is decreasing. Teacher shortages are occurring and specialized content areas are being eliminated or cut back in schools for lack of teachers, materials and facilities. At the same time, parents are insisting upon the purchase of computers and the public is demanding more efficiency in schools.
>
> A case can be made for improving education. A changing society and changing economy suggest a changed education. The increasing rate of change in society suggests a more flexible system of instruction. The increasing costs of education suggest a more efficient form of education.
>
> Fortunately, communications and information technology can bring about this change. Through technology we can create a universal system of education which can be controlled at the level of the learner. Through technology we can create a system whereby every child can interact with a sophisticated learning system—for pennies—while returning millions in royalties to the developers. (p. iii-4)

The ITV Futures Planning Group identified 23 issues facing the future of learning technologies. Seventeen of these issues were addressed in more depth in issues papers, with recommendations for further action. Discussions and position papers continue to emerge at this writing as the ITV community grapples with its destiny.

Two major complementary efforts have been supported by the Corporation for Public Broadcasting (CPB). One project, a direct continuation of the first "ITV Futures" meetings, involves nine working groups, each concentrating on a different area of need as identified by the learning technologies community and the Futures Planning Group. This effort has culminated in a publication called "ITV Futures: The Next Step," a compilation of the thinking of nine working groups representing the ITV community.

A second project which grew out of the first is a CPB mandate to the Public Broadcasting Service (PBS) to revitalize public television's role in elementary/secondary education. The first result of this effort is a discussion draft of a long-term plan entitled *Meeting Educational Needs Through Public Television and Learning Technologies*. Through discussions at meetings, teleconferences, and written response forms, the field is being asked to respond to this draft and to provide input for the final plan, which will be presented to CPB on December 1, 1987.

Through these two major national activities involving hundreds of people in the ITV community, it is hoped that the field can coalesce in an unprecedented mobilization of funds and talent to "move educational television and other technologies forward with the giant, purposeful steps that the industry has long been struggling to take" (*PBS Discussion Draft*, 1987, p. i-6).

As one reads through the discussion papers that have emerged from both groups, three observations come to mind. The first is that in the "hoopla" surrounding the launching of a major national campaign, it seems difficult to avoid falling into the rhetoric that has plagued educational technology and especially ITV for so many years. The talking papers from both groups are filled with the grandiose goals and impossible promises about changing education that filled the literature of the 1960s and that to this day have the public fending off the image of ITV as a failed medium. *Plus ça change, plus c'est la même chose.*

The second observation is that the tension between centralization and decentralization is alive and well in the ITV world, and produces predictably divergent views about what achievements the future should hold and how they should be accomplished. Along with this, predictably, come the turf declarations and self-interest-inspired proposals which, in their efforts to ensure institutional continuity and growth, sometimes overlook exciting and more practical alternatives.

But the third and overriding impression one gets from the documents is one of an energetic, vibrant group of dedicated professionals struggling to identify, discuss, and resolve the most pressing problems facing ITV, and to set plans for a productive future. This kind of exercise is healthy, stimulating, and bound to produce movement toward a more positive image for instructional television in the education arena.

Without further commentary from this writer unless otherwise noted, the balance of this chapter is dedicated to the presentation of the issues identified and discussed by the ITV Futures Planning Group and highlights from the draft plan presented by PBS. The final chapter of this monograph resumes editorial commentary on this extensive futures effort.

The issues are taken from a document entitled *Learning Technology Issues for the Future* prepared by the ITV Futures Planning Group, and dated August 7, 1985. The PBS document to which reference is made is the Discussion Draft, *Meeting Educational Needs Through Public Television and Learning Technologies: A Long Term Plan*. This document was prepared by the PBS Elementary/Secondary Service and dated July 1, 1987.

Research and Development Issues

Optimal utilization of learning technologies depends on the availability of well-produced resources targeted at *identified* educational needs. To accomplish this goal it may be necessary to develop ongoing, systematic, formal needs assessment which is conducted or at least coordinated at the national level.

To facilitate coordination within a decentralized industry, there is a need to develop a long-range program planning process which identifies national and local needs as the basis for individual as well as collective actions.

Present needs assessment in ITV was characterized by the Futures Planning Group as lacking (1) systematic effort at the national level, (2) uniform methodologies, and (3) coordination among various entities. Discussion centered around the feasibility of standardizing needs-gathering procedures, developing prototype plans for collecting needs data and encouraging agencies to field test them, and forming a national task force to define roles, develop instruments, and train ITV personnel in their use.

However, it was concluded that a formal, national needs assessment effort would not be recommended, since past experience suggests that such an effort is "cumbersome, unwieldy, and ultimately not responsive or timely for effective program planning."

Design Issues

In order to ensure the development of high quality instructional materials, the field must cultivate and nourish a body of well-trained instructional designers.

In spite of their proven potential as powerful instructional tools, learning technologies continue their identity as educational luxuries rather than as a necessary component of established curriculum. Curriculum is an area most vulnerable to accelerating rates of change, both in technology and educational philosophy. Planning learning technology course design to accommodate anticipated curriculum needs is therefore essential.

To improve acceptance and use of programs, it is necessary to establish

a model process for content development which utilizes the full advantages of each medium for learning and which develops a sense of ownership at the intermediary level (teachers) and user level (learners).

The Futures Planning Group made note of the need for preservice and inservice training for instructional designers and noted that this training has to be more technical than that provided in general teacher education programs. Its recommendations include (1) communicating with universities about the need for training instructional designers who understand video-based curriculum materials; (2) sustaining well-paid job opportunities for skilled instructional designers; (3) supporting the instructional designer with a project environment that is based on increased funding for design and evaluation functions and timelines that allow consensus to occur; and (4) providing a creative atmosphere in which to work.

Regarding curriculum planning, the Futures Planning Group suggested establishing a National Learning Technology Advisory Curriculum Committee to advise on curriculum trends and changes. It also recommended establishing a national database which would include state curricula or minimum skills outlines, demographics, coursework in production, research projects in progress, and a job bank. In addition, it called for the compilation of annual utilization statistics at the national level.

Production Issues

Research, instructional design, and productions of uneven quality are inefficient and wasteful to an industry with limited production resources. They also undermine efforts to increase the appreciation of the media's effectiveness for learning. There is a need to develop quality control standards or principles for research, instructional design, and production.

As a means of retaining a critical mass of best talent, we should acknowledge and nourish a limited number of national production houses.

The diversity of conditions under which ITV programming has been produced through the years was acknowledged by the Futures Planning Group as the source of quality control problems, and there was a call for more attention to educational theories and better use of instructional strategies to promote learning.

The Futures Planning Group also recommended that a working group be established to set new and better standards of excellence. The working group has subsequently produced a draft document that considers standards from a variety of perspectives including production, instruction, and availability of rights.

Regarding the "pooled talent" issue, the Futures Planning Group made note of the fact that budgetary problems of recent years have caused a situation in which "ITV producers are currently subsidizing a system that is not adequately subsidizing them." To alleviate this problem and to assure quality control, one of the group's recommendations is the establishment of

teams of certified instructional designers and producers composed of key industry personnel. Another recommendation which would require less "shake-up" would be the establishment of a production cartel, cooperative, or collective, where producers would work together rather than compete for limited funds.

Distribution Issues

To respond to the changing needs of users and providers of instructional programming, there is a need to develop a distribution plan which will assure that 90 percent of the schools will have all current instructional programming available by some medium (broadcast or nonbroadcast) by 1990.

There is a need to re-evaluate non-broadcast distribution means, especially videotape distribution, of instructional programming that ensures accessibility to teachers (for optimal utilization) and an adequate return on investment to producers (to encourage future production efforts).

The discussions surrounding these issues confirmed that these are by far the most complex challenges facing the ITV industry. The Futures Planning Group acknowledged the changing role of the broadcast schedule in ensuring accessibility of ITV programming to teachers. With the growing dependence on video recording and playback, distributors of programming have more alternatives for getting the product to the audience, but they also have many more headaches about licensing, duplication rights, etc.

The Video Library Project was highlighted as worthy of study for more widespread implementation. WNED, Buffalo, New York, and WITF, Hershey, Pennsylvania, have become overnight video libraries for their clients. In addition to their regular daytime broadcast schedules, both of these stations distribute ITV programming to the schools for recording purposes in the early morning hours from 1 am to 4 am. Timers are set on school VCRs, and tapes can be stored in the school building for as much time as rights allow. Entire series are sent at one time rather than one or two programs a week from a series. This concept is more practical for school users and potentially frees up valuable air time on PBS stations during the day.

The Futures Planning Group observed that the single-channel capacity of public broadcasting stations is an enormous limitation, and one that is unnecessary in the face of numerous multiple-channel alternatives available today. Public television facilities were urged to re-think their distribution systems in the context of a public telecommunications operation. It was suggested that ITV proponents have means to monitor and influence public policy affecting the availability and viability of multiple-channel services.

Acknowledging their commitment to learning technologies, the Futures Planning Group discussed the need for more sophisticated distribution systems for computer and interactive technologies as well as for ITV. The "electronic highway" concept developed jointly by Maryland ITV and the

Central Educational Network (CEN) was commended as worthy of further exploration.

As an interim solution to the very complex issues surrounding broadcast-non-broadcast rights and revenues, the Futures Planning Group recommended that a task force be formed to discuss and explore options that would increase the net return of revenue to producers through broadcast and non-broadcast leasing, sales, and licensing. Recommended items for discussion are:

- An analysis of pricing structures that encourage purchases and leases by small buyers;
- The release of some series for non-broadcast distribution only; and
- Exploring the potential of new and non-traditional markets, i.e., international, home video, child-care facilities, and libraries.

Promotion Issues

In school television programs have not been made an integral part of the learning process because those directly involved with the implementation, funding and overall support of that process do not know of the quality and teaching potential of these materials. Most television programming is viewed as peripheral to "real teaching" and has few influential advocates speaking on its behalf. The system has done little to make these groups aware of ITV's value; in fact, the ITV system itself knows or seems to care little about promoting itself.

A nationwide promotional campaign for specific series is essential to increase ITV utilization and awareness. A national campaign which benefits from cost efficiencies and reach is almost impossible because of differing local schedules. Therefore the system should consider distributing a promotable core schedule of instructional programming.

Discussion of these issues centered on the fact that promotion had to start at the local level, notably with educators on the classroom and building levels. Suggestions included (1) making teachers aware of what was available in ITV programming, and of the fact that their peers were part of the program selection process and usually in the development of the series itself; (2) developing grids that connect textbooks and video materials to the state or local curriculum; and (3) running local, district, state, regional, and national workshops that heighten the concept of relevance of ITV to the curriculum.

Several funding strategies were suggested for mounting a strong national campaign for ITV in general and for certain offerings in particular. The need for funding to advertise was a constant thread in these discussions.

The Futures Group continued a long-lasting discussion about the feasibility of an ITV core schedule that would be made up of the most widely used series spanning many curriculum areas and grade levels. The concept is borrowed from the public television core schedule, whereby stations agree to

broadcast the same programs on the same day or within the same week so that advertising dollars can be consolidated and national promotions can be mounted. The result is high visibility for some educational postsecondary series such as "The Brain" and "Vietnam." For public television, the core schedule is now two hours, four nights a week.

The Futures Planning Group acknowledged the value of a core schedule for national promotional purposes and recommended that an experimental year be inaugurated to identify the most widely used series that might be appropriate for the core; that rights payments be negotiated for these series; and that necessary funds be found for a major national promotional campaign.

Use Issues

In any review of the weaknesses of our industry, poor communication among the members is likely to be cited. The ITV Futures Planning Group recognizes that instructional technology personnel throughout the country need easy access to information and easy access to one another.

In order to increase utilization of learning technologies in schools and at home, the work of instructional technologists must be perceived by educators and parents, school boards and legislatures, and, indeed, by the stations and related learning technology agencies, as important, effective, and responsive.

If the learning technology community is to increase its effectiveness in promoting the use of media for learning, particularly as technology and learning methods change, a comprehensive training and recruitment strategy must be developed. There is a critical need for a full range of preservice, inservice, continuing education and professional development opportunities that will increase the knowledge and skills of learning technology personnel presently working in the field and help to recruit new, highly qualified persons into the field of learning technology.

Learning technology is still not incorporated as an integral part of the teaching process. More inservice and preservice education is not the answer. We must address the many issues over which teachers have no control but which govern their incorporation of learning technology into their instructional planning.

Because of the nature of the educational process, instructional, adult learning, and general education programming must be made available in the widest possible manner if it is to be effective. Program rights policies within public television have tended to be guided by the needs of prime time general audience programming, and these policies have been reflected in collective bargaining and copyright arrangements. These arrangements may or may not be satisfactory to ITV and educational producers who, in seeking wider rights, may be faced with significant administrative and financial burdens not confronting producers of general audience programming. This paper generally explores these current arrangements and recommends that instructional and educational producers and users establish guidelines in this area.

In response to the first use issue, which is really a communication issue, the Futures Planning Group recommended a staged plan to design and implement a national clearinghouse to serve the industry. A detailed flowchart was provided outlining the proposed components in such a database. Ten main categories were suggested: Research/Evaluation, Funding, Instructional Design, Production, Programs in Circulation, Distribution, Utilization and Promotion, People and Agencies, Interactive Video Training/Instruction, and Bulletin Board.

Work has progressed rapidly since these guidelines were written, and the learning technologies community now advertises three databases in progress: EDISON, CURRICULUM CONNECTION, and LEARNING LINK.

EDISON (Educational Information Services On-Line) will use an online database and universal utility to provide current information to the learning technologies community. Some of the information to be included in the clearinghouse database will be ITV programs available; formative and summative evaluations of series currently in use; ITV productions in progress; potential and actual funding sources for learning technology projects; information on various distribution methods; and a learning technologies calendar.

The business plan for EDISON is now in progress, funded by CPB and carried out by CEN and station WVIZ-TV in Cleveland. The target users for this system are station personnel, educational agencies, and regional and national personnel involved with the learning technology industry.

CURRICULUM CONNECTION is a database already in use in Cleveland, Ohio, and in demonstration in eight other sites in the country. Designed and located at WVIZ-TV, this computerized database contains complete information on each of the nearly 2,400 ITV programs distributed by the station. As its name implies, one of the database's primary functions is to match individual ITV programs quickly and easily with specific elements of the curriculum. It utilizes the appropriate Sears subject headings with nearly 10,000 key words. The database includes broadcast and videotape library information, information on ancillary materials and distributors, and complete program descriptions, as well as electronic mail, conferencing, and bulletin board components. The primary target users for this system are K-12 educators and ITV utilization staffs.

LEARNING LINK is an interactive communications system that has been operating at WNET-13 in New York since November 1985. Operating 24 hours a day, 7 days a week, LEARNING LINK provides schedule and program information for the entire broadcast day up to weeks in advance. It provides program descriptions which include information on curriculum appropriateness, recording rights, ancillary materials, projected air dates for individual program titles, and cross references to sample questions and classroom activities. The FORUMS feature of LEARNING LINK is an interactive teaching resource through which users can exchange information, teaching tips, and suggestions on a variety of issues. Through GATEWAYS, LEARNING LINK customers can gain access at reduced rates to specialized remote databases such as newspapers, the ERIC collection, and the Wilson databases. Another special feature of LEARNING LINK is its RESOURCE

CATALOG, which provides information on a wide range of topics including museum and cultural resources in the community.

Target users for LEARNING LINK are classroom teachers and other school personnel, students, professional and community organizations, and cultural institutions.

In response to the second use issue, that of increasing the importance of the work of learning technologists in the eyes of all consumers including parents, school boards, and public television station personnel, the Futures Planning Group proposed two recommendations. The first was the continuation and strengthening of the support of ITV utilization people, of which the group noted there are far too few, and the second was the establishment of an inter-regional task force to develop and implement "a national model that will increase the quality and quantity of effective utilization of instructional technology." The latter recommendation was acted upon immediately and a proposed national plan is currently under discussion.

Perception of the need for ongoing training opportunities for personnel in the field brought recommendations that the coordination responsibility be assigned to an appropriate agency and that a national professional development activity be launched. As an initial follow-up to this recommendation, a Professional Development Working Group was established and a survey was conducted in the summer of 1986. The survey was sent to 350 individuals identified as administrators of ITV services.

The survey sought data on prior participation in professional development activities and on current desires for such participation. Results indicated that in the past three years over half of the 139 respondents had participated in activities relating to other new technologies, ITV technology, and marketing of ITV services and programs. Top indicated needs for professional development activities included identification of funding sources for ITV projects, other new technologies, effective use of management information (e.g., databases), preparation of ITV-related grant proposals, and ITV technology. The busy respondents indicated they would prefer these activities be short (part- or whole-day) and attached to a scheduled conference or meeting rather than an independently scheduled event (Professional Development Working Group, 1987).

The complex issue of rights led to the recommendation for yet another working group to determine what rights are essential and/or recommended for effective ITV use, and to explore through appropriate legal counsel improvements in systemwide copyright arrangements.

Measurement and Evaluation Issues

A definitive research statement on the effectiveness of television for learning must be widely disseminated to overcome, once and for all, the reluctance by many to accept television as a viable and effective instructional tool.

A consistent process for evaluating learning technologies programming/products could assure the development of high-quality, useful instructional materials.

A comprehensive system for collecting carriage data is needed to determine distribution and redistribution of ITV series to enable the cost-effective and efficient use of the satellite schedule.

There is a need to improve research on the effective use of format and media for learning and to develop effective means of distributing research findings.

Discussions surrounding this last set of issues centered around recent publications that reiterated the effectiveness of television as a learning tool. The Futures Planning Group provided a 14-page bibliography but no original work on the research issues.

It is premature to present at length the PBS Long-Term Plan, as it is in the first-draft stage and significant revisions are already underway. Overall, the tone of the existing discussion draft is optimistic and far-reaching, with centralization of service being the dominant theme. It calls for raising a $20 million endowment by 1990 and $100 million by the end of the century to support quality instructional programming and program-related services for children and youth.

Early responses from the ITV community indicate its preference for maintaining decentralization of services wherever possible, suggesting that PBS confine its responsibilities and functions to those things which cannot be done or are not currently being done by any other entity. These include performing advocacy and public relations functions in at least three ways: (1) serving as national spokesperson for the profession; (2) creating and maintaining a clearinghouse of information and a database of resources, potential funders, research results, etc.; and (3) providing background information for local agencies to assist them in creating awareness about all aspects of instructional technology.

The next few years should be extremely interesting as the learning technologies community sorts out its responses to these issues and interests.

A REAPPRAISAL OF INSTRUCTIONAL TELEVISION

In the foregoing chapters the beginnings, current status, and future needs of instructional television in the United States have been examined. This has been done against the backdrop of widespread perceptions of ITV as a failed medium, perceptions fathered by the assumption that an innovation—any innovation—can make a universal and irreversible difference in schools and schooling; perceptions kindled by the expectation that schools and teachers should all march to the same drummer. It would seem that a profound and continuing disappointment with the reality of schooling, much like the human condition of disappointment with life's setbacks, generates the need for solutions of Messianic proportions.

This examination of instructional television has found it to be neither Messiah nor failure. It has found, instead, that ITV is one of many tools available to teachers today. Unlike the most popular educational tools, e.g., chalk, textbooks, and pencils, ITV requires a rather elaborate and relatively expensive support system to convert availability to accessibility. Also, unlike most educational tools, instructional television has a commercial counterpart that many educators feel has a negative influence on children. These two factors in combination have kept ITV from achieving a ubiquitous presence in classrooms. They have not, however, kept ITV out of the classroom.

Several factors have surfaced as critical to the present and future of instructional television. The most obvious and immediate is an issue of public relations. Instructional television is apparently one of the better kept secrets in education, and this has not served it well either in terms of increasing teacher use or in terms of informing the research community of its presence and value. The instructional television industry needs advocates who can lobby convincingly for its effectiveness on all fronts from funding to actual use. Colleges of education, typically bastions of conservatism modelling little more than the Socratic method, should be among the first targets of a serious public relations effort. Preservice and inservice teachers as well as researchers can be reached in that arena.

Another factor, one that is much more complex, is that of priorities. Both the history of ITV and the current activity in preparing for its future reflect an industry preoccupied with hardware. On balance it appears that many more human and material resources have been devoted to harnessing broadcast, cable, microwave, and, more recently, satellite technologies to move signals around than to determining the kinds of signals to move and why. This is not to downplay the importance of availability and accessibility; obviously, without attention to these aspects of the technology, instructional television would not survive. And without this focus in the past we could not claim that thousands of teachers are using and millions of children viewing ITV yearly. However, it is to suggest that a hardware-driven model too frequently results in the tail wagging the dog.

One effect of this preoccupation with distribution modalities is the tendency to pattern ITV productions after commercial and public television. We therefore create time-bound programs packaged in groups to form series. It

is now known that very few teachers use entire series, and that even fewer use the materials directly from the broadcast and satellite signals. The latter has been acknowledged and accommodated with videotape. The former has yet to be addressed.

To this writer's knowledge the ITV community has never seriously investigated, without pre-ordained constraints, the types of visual material most needed to help teachers do their jobs better, and the most convenient way for teachers to acquire and use these visual materials. It has, from the beginning, been assumed that the adaptation of television technology for educational uses was a rather straightforward lateral move.

It is time to let a pedagogical imperative drive the creation of teaching materials. It would probably be found, if a true needs assessment were to be done, that teachers need conveniently accessible state-of-the-art visualizations of the individual concepts, skills, and facts they are trying to impart. Empirical evidence has established that pictures facilitate recall of information presented in prose materials (Anglin, 1986; Levie & Lentz, 1982). Most studies use drawings or photographs interspersed in prose print, resulting in an average improvement in learning of 36 percent for groups reading with pictures in comparison to groups reading text alone. How much more potentially effective would learning be if the motion, directionality, time-lapse, animation, etc., were used to help the visuals on the page come to life? The means to do this are available. At the risk of sounding like yet another new technology evangelist, this writer suggests that instructional television professionals set as their goal for the future the production of a videodisc to accompany every teachers' manual for every textbook for which realistic visuals are appropriate.

It is misleading and unfortunate that videodisc has been touted as primarily an individualized learning medium. While individualization is its most glamorous and powerful application, videodisc's uniqueness is in the fast and easy random access to the visual material it provides. There are actually three educational applications appropriate for this versatile medium:

- Videodisc is an illustration device for the teacher—the chalkboard, movie projector, slide/tape projector, overhead, and video player of the electronic age. The teacher merely uses the keypad to access specific frames, sequences, or programs keyed to pages in the text.

- Videodisc is appropriate for small group activities—for sub-groups within a class to stimulate cooperation, problem-solving, peer tutoring, etc. A teacher might choose to reward or remediate a small group by assigning them to the videodisc corner for appropriate activities.

- Videodisc is an excellent individualized instruction device. Tutorials, drill and practice, and simulations created on this sophisticated teaching tool under computer control have the potential for meeting the needs of a wide variety of learners.

At present most educators' eyes glaze over when videodisc is discussed.

The thought of introducing yet another medium into an already overtaxed school system is more than most can absorb. Their resistance is a valuable safeguard in presenting yet another hardware-driven adoption. The issue should not be the medium itself, but the concept of providing visual support to elements of the curriculum that need visualization. And the focus should be on the most efficient and cost-effective way to do this.

If the conclusions of this reappraisal of instructional television can be reduced to one suggestion, it is that the ITV community mobilize its considerable talents, experience, and resources to expand the range of visual materials it provides to schools. A fair number of teachers and a larger number of students are benefiting from the many ITV series now in use. There is obviously a need to continue to produce good programming. In addition to the kind of programming already available, there is evidence that teachers need more specific visual materials, visualizations geared directly to curriculum topics that could be easily accessed for integration into a lesson.

There are those who continue to hope that the teaching/learning process will someday become the driving force behind decisions in education and behind the technologies that service it. Perhaps, after all, this is the panacea sought by educators.

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